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ABSTRACT

This packet contains a program guide and Career Merit Achievement Plan (Career MAP) for the implementation of an agritechnology program in Florida secondary and postsecondary schools. The program guide describes the program content and structure, provides a program description, lists job titles under the program, and includes a curriculum framework and student performance standards for agritechnology courses. The curriculum framework outlines major concepts and content, laboratory activities, program specifics, and intended outcomes; the student performance standards guide lists each standard and the behaviors expected to show mastery of each standard. The guide also provides information on the following: facility design for agritechnology laboratories and classrooms, equipment, safety, program implementation, teacher professional development, teacher certification, professional organizations and support services, and instructional resources (a listing of sources of 37 print materials, 13 audiovisuals, and 17 computer software programs). Appended to the program guide are the following: (1) sample teaching-learning plans for agritechnology; and (2) a sample student learning guide that includes program title, intended outcome, activity, performance objective, enabling objectives, terms, procedures, information sheets, and self-check with answers. The Career MAP is a checklist, to be kept by student and teacher, of student progress in the competencies required for entry into jobs in the agritechnology field. (KC)

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FLORIDA VOCATIONAL PROGRAM GUIDE FOR AGRITECHNOLOGY

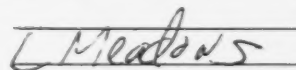
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FLORIDA VOCATIONAL PROGRAM GUIDE FOR

AGRITECHNOLOGY

State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

Division of Vocational, Adult, and Community Education
Bureau of Vocational Program and Staff Development

July 1991

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INTRODUCTION

The *Florida Vocational Program Guide for Agritechnology* has been developed to provide information that will be useful to local administrators, regional coordinating councils, teachers, and others charged with the responsibility of offering vocational education in Agritechnology in school districts, area vocational-technical centers, and community colleges. The final planning, implementation, and evaluation of any educational program, however, must be done within the context of local conditions and local needs.

Many of the elements involved in the creation and maintenance of a vocational education program are generic to all subject areas; these issues are addressed in detail in the *Florida Vocational Program Implementation Guide (FVPIG)*, **which should be considered an essential companion piece to this document.** The FVPIG contains information on the following:

- the importance of, as well as development strategies for, student learning guides
- information addressing concerns about program planning and implementation
- teacher requirements, updating, and certification
- program-evaluation requirements
- in-depth program-component description

The *Florida Vocational Program Guide for Agritechnology* will serve to identify particular considerations in the organization, operation, and evaluation of this specific vocational education program.

This program guide helps ensure program equivalency. Agritechnology programs, if implemented throughout Florida according to the criteria described in this document, will help many citizens fill important roles in our state and national work force.

PROGRAM CONTENT AND STRUCTURE

The content of the Agritechnology program is based on occupational competencies and employability skills required for entry into agritechnology businesses and industries. The basic content of this program is described in the Florida Curriculum Framework and Student Performance Standards (SPSs). The Student Performance Standards were validated during a pilot program for the enhancement of vocational agriculture education by nine pilot sites during the 89-90 and 90-91 school years. This validation effort was sponsored by the DVACE.

The Agritechnology program includes both classroom and practical learning experiences that provide students with career information and job requirements for occupations in agritechnology businesses and industries. This program provides students with an initial exposure to the skills and attitudes associated with careers in related agricultural occupations. The basic skills and attitudes related to these occupations are indicated as intended outcomes in the Curriculum Framework of this guide.

Job Titles

The purpose of the Agritechnology program is to prepare students for employment as farm worker; farmer; farm worker, diversified crops; farm-machine tender; farm worker, livestock; agricultural product salesperson; agricultural-product-marketing representative; farm and garden-supply worker; custom harvest operator; and fertilizer service worker. Descriptions for the above job titles can be found in the *Dictionary of Occupational Titles*.

Curriculum Framework and Student Performance Standards

Program objectives and content should be consistent with the Vocational Education Program Courses Standards as approved by the Florida State Board of Education. Provided on the following pages are the Curriculum Framework and SPSs for Agritechnology courses as listed in the official *Vocational Education Program Courses Standards* document. Since these SPSs are continually updated, you should check every year with your district's agribusiness and natural-resources education supervisor and the regional program specialist for a current version.

CURRICULUM FRAMEWORK		PROGRAM AREA: <u>Agriculture</u>
FLORIDA DEPARTMENT OF EDUCATION		EFFECTIVE DATE: <u>July 1991</u>
PROGRAM TITLE: <u>Agritechnology</u>		
CODE NUMBER: Secondary <u>8106800</u>	Postsecondary _____	
Florida CIP <u>0101.039901</u>		
SECONDARY SCHOOL CREDITS <u>3</u>	COLLEGE CREDITS <u> </u>	POSTSECONDARY ADULT VOCATIONAL CREDITS <u> </u>
APPLICABLE LEVEL(S): <u> </u> 7-9 <u>X</u> 9-12 <u> </u> Postsecondary Adult Vocational		
<u> </u> Postsecondary Vocational		<u>X</u> Other <u>10-12, 30, 31</u>
CERTIFICATION COVERAGE:	VOC AGRI @4 AGRI PROD #7	AGRI @4 AGRICULTUR 1 2

I. **Major Concepts/Content.** The purpose of this program is to prepare students for employment in positions in the agriculture industry, including farm worker, general (421.687-010); farmer (71002505); farm worker, diversified crops (407.687-010); farm-machine tender (409.685-010); farm worker, livestock (410.664-010); agricultural-product salesperson; agricultural-product-marketing representative; farm and garden-supply worker; custom harvest operator; or fertilizer service worker; or to provide supplemental training for persons previously or currently employed in these occupations.

This program is one of the three Florida standard cores of agriculture competencies. Completers of this program will be prepared to enter advanced training and education in specialized fields of agriscience or agribusiness. They may also be employed as trainees or beginning workers in various agriscience- or agribusiness-related positions in certain businesses and industries.

The content includes, but is not limited to, instruction in livestock and crop production, processing, and marketing; agriculture sales and services; agricultural mechanics; employability skills; mathematics; basic science; biological sciences; communications; and human-relations skills.

Listed below are the courses that this program comprises when offered at the secondary level:

8106810 Agriscience Foundations

8106820 Agritechnology 1

8106830 Agritechnology 2

- II. **Laboratory Activities.** Agriscience laboratory activities (shops, wet labs, land labs, and greenhouses) are an integral part of this program. These activities must involve the safe use and application of high-technology equipment, such as computers and computer software, telecommunications equipment, and scientific-testing and observation equipment, as well as mechanics' tools, field tools, carpentry tools, arc welders, oxyacetylene torches, tractors and field equipment, chemical applicators, power sprayers, irrigation equipment, and fire-control hand equipment.
- III. **Special Note.** Providing leadership-training experiences and reinforcing specific vocational skills are integral parts of this instructional program and shall be provided. FFA (secondary) and the National Post-Secondary Agriculture Student Organization (postsecondary) are appropriate vocational student organizations for providing this training, and students are encouraged to participate.

Planned and supervised occupational activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student project, (3) placement for experience, and (4) cooperative education. Because of the production and marketing cycle of agriscience industries, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

The cooperative method of instruction is appropriate for this program. Students can take the cooperative training either during the program or after completing it. Whenever the cooperative method is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; and a workstation reflecting the equipment, skills, and tasks that are relevant to the occupation that the student has chosen as a career goal. The student must receive compensation for work performed.

The particular outcomes and SPSs that the handicapped student must master to earn credit must be specified in the student's individual education plan (IEP). Additional credits may be earned when outcomes and standards are mastered in accordance with the requirements indicated in subsequent IEPs. The job title for which the student is being trained must be designated in the IEP.

IV. **Intended Outcomes.** After successfully completing this program, the student will be able to:

01. Describe the socioeconomic role of agriculture.
02. Apply important scientific and technological principles to agribusiness and natural resources.
03. Practice agricultural safety.
04. Demonstrate the use of tools and equipment, and describe the principles of agricultural mechanics.
05. Describe the principles of pest management for insects, diseases, and weeds.
06. Describe the principles of plant growth and reproduction.
07. Apply management skills and economic principles to agribusiness and natural resources.
08. Explain the basic functions of the marketing process in agriculture.
09. Demonstrate human-relations, communications, and leadership skills.
10. Explore the scope of the agriscience industry.
11. Provide for proper animal health and nutrition.
12. Identify procedures in animal production and reproduction.
13. Use procedures for exhibiting and marketing animals.
14. Compare, select, and use plant-production systems.
15. Fertilize plants and crops.
16. Irrigate plants and crops.
17. Control plant pests.
18. Operate, maintain, and service facilities, tools, and equipment.
19. Describe procedures for harvesting and marketing plant materials.
20. Apply principles of agribusiness finance.
21. Demonstrate leadership, employability, communication, and human-relations skills.

STUDENT PERFORMANCE STANDARDS EFFECTIVE DATE: July 1991

PROGRAM AREA: Agriculture SECONDARY NUMBER: 8106800

PROGRAM TITLE: Agritechnology POSTSECONDARY
NUMBER: _____

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF AGRICULTURE--The student will be able to:

- 01.01 Prepare an overview of the history of agriculture.
- 01.02 Discuss agricultural products and services important to the local, state, national, and global economy.
- 01.03 Investigate career opportunities in agriscience and identify which school activities will help one prepare for those careers.
- 01.04 Discuss agriculture's role in the interaction of population, food, and energy.

02.0 APPLY IMPORTANT SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES--The student will be able to:

- 02.01 Discuss the importance of scientific classification in agriculture.
- 02.02 Use scientific methods to solve problems in agriculture.
- 02.03 Demonstrate the use of genetics, including probability applications, through an agricultural project/activity.
- 02.04 Analyze how recent technology is impacting agriscience.
- 02.05 Identify the components of an agricultural ecosystem and recognize the role of each.
- 02.06 Construct and analyze a diagram of a biological food chain common to Florida agriculture and natural resources.
- 02.07 Describe how water, carbon, nitrogen, oxygen, sulfur, and phosphorus are recycled naturally.
- 02.08 Evaluate soil profiles, land-capability classes, and soil-conservation practices.
- 02.09 List the components of Florida's freshwater systems (lakes, groundwater, aquifer, sinkholes, rivers, swamps), and explain the importance of managing these resources.
- 02.10 Explain how increasing or decreasing the use of one natural resource may affect another resource.
- 02.11 Describe the causes and effects of air, water, and land pollution, and identify ways to prevent pollution.
- 02.12 Explain the flow of energy from the sun, through agricultural systems (i.e., the common food pyramid), and back into the abiotic environment.

- 02.13 Recognize the environmental requirements necessary for a productive natural or man-made aquaculture system.
- 02.14 Apply principles of sound waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

- 03.01 List the most common causes of agricultural accidents.
- 03.02 Discuss the importance of following proper safety precautions.
- 03.03 Demonstrate safety procedures in the classroom and laboratory.
- 03.04 Describe the importance of following the directions on chemical containers and in equipment operator manuals.
- 03.05 Recognize the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).
- 03.06 Demonstrate safe and effective use of laboratory equipment, instruments, and materials.

04.0 DEMONSTRATE THE USE OF TOOLS AND EQUIPMENT, AND DESCRIBE THE PRINCIPLES OF AGRICULTURAL MECHANICS--The student will be able to:

- 04.01 Describe the importance of using the proper tools and equipment for the job.
- 04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
- 04.03 Demonstrate the ability to use an equipment manual.
- 04.04 Demonstrate the use of selected tools and equipment.
- 04.05 Service, maintain, and store tools, equipment, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF PEST MANAGEMENT FOR INSECTS, DISEASES, AND WEEDS--The student will be able to:

- 05.01 Identify major types of pests and weed infestations.
- 05.02 Identify and select an appropriate control for each major type of pest, including the use of Integrated Pest Management.
- 05.03 Describe symptoms of pesticide poisoning.
- 05.04 Extract pertinent information from a pesticide label.
- 05.05 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and Environmental Protection Agency (EPA) regulations.
- 05.06 Clean and store pesticide-application equipment, safety clothing, and safety equipment.
- 05.07 Identify the proper disposal of containers and residual pesticides.
- 05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT GROWTH AND REPRODUCTION--The student will be able to:

- 06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
- 06.02 Describe the functions of roots, stems, leaves, and flowers.
- 06.03 Demonstrate sexual and asexual plant propagation.
- 06.04 Demonstrate the effects of nitrogen, phosphorus, and potassium (N.P.K.) on plant growth.
- 06.05 Extract pertinent information from a fertilizer label.
- 06.06 Describe the short- and long-range impact of fertilizer on people and the environment.

07.0 APPLY MANAGEMENT SKILLS AND ECONOMIC PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES--The student will be able to:

- 07.01 Identify basic economic principles applicable to agribusiness.
- 07.02 Explain the importance of local, state, and federal regulations and required documentation affecting agriculture.
- 07.03 Describe the types of agribusiness by organizational structure.
- 07.04 Select and use computer applications appropriate to agribusiness.
- 07.05 Form one or more inferences or hypotheses from records summarized in tables, graphs, or pictures.
- 07.06 Keep and maintain supervised agricultural experience (SAE) records.
- 07.07 Interpret legal descriptions of land in Florida.

08.0 EXPLAIN THE BASIC FUNCTIONS OF THE MARKETING PROCESS IN AGRICULTURE--The student will be able to:

- 08.01 Describe key factors in marketing agricultural products.
- 08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

- 09.01 Demonstrate acceptable work habits and attitudes.
- 09.02 Follow oral and written directions with understanding; form questions that clarify directions, as needed.
- 09.03 Communicate effectively in oral, written, visual, and nonverbal modes; demonstrate effective telephone skills.
- 09.04 Recognize and demonstrate reflective listening skills and assertive communications skills in the workplace.
- 09.05 Conduct small, informal, and group meetings.
- 09.06 Demonstrate a knowledge of the opportunities for leadership development available through an appropriate student organization.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

- 10.01 Investigate career opportunities in agriscience industries. Levels I and II.
- 10.02 Describe training requirements for entry and advancement in agriscience careers. Levels I and II.
- 10.03 Identify professional organizations and trade journals in the agriscience industry.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

- 11.01 Recognize and describe the prevention and treatment of common animal diseases, disorders, and pests. Levels I and II.
- 11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels.
- 11.03 Clean and disinfect animal equipment and facilities.
- 11.04 Explain proper disposal of animal waste with regard to sanitation, economics, and environmental implications.
- 11.05 Describe nutritional requirements of animals.
- 11.06 Formulate and compute least-cost feed rations.
- 11.07 Select growth stimulators and implants.
- 11.08 Determine feeding rates and methods of feeding animals.

12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION--The student will be able to:

- 12.01 Identify major parts of livestock and poultry anatomy.
- 12.02 Identify commercially important breeds of animals.
- 12.03 Describe desirable characteristics of breeding and market animals.
- 12.04 Identify wholesale cuts of beef, pork, lamb, and poultry.
- 12.05 Compare and select appropriate breeding methods for different agricultural enterprises.
- 12.06 Explain the reproductive cycles of commercially important animals.
- 12.07 Identify signs of animal pregnancy, parturition, and infertility.
- 12.08 Describe approved care for newborn animals.
- 12.09 Describe methods of permanent animal identification.
- 12.10 Describe methods of restraining, loading, handling, and transporting animals safely.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

- 13.01 Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.
- 13.02 Collect and interpret market reports and identify market outlets for livestock.

- 13.03 Compare and select appropriate marketing systems.
- 13.04 Determine appropriate evaluation criteria for animals.
- 13.05 Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

14.0 COMPARE, SELECT, AND USE PLANT-PRODUCTION SYSTEMS--The student will be able to:

- 14.01 Compare different plant-production systems.
- 14.02 Propagate, grow, and transplant plants.
- 14.03 Identify varieties of local commercial plants and field crops.
- 14.04 Select and prepare a site and seed bed for planting.
- 14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.
- 14.06 Calculate planting rates and spacing; solve time, distance, area, and volume problems in agriscience.
- 14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

- 15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
- 15.02 Identify common nutrient-deficiency symptoms in plants.
- 15.03 Calibrate fertilization equipment and fertilize plants; solve time, distance, area, and volume problems in agriscience.
- 15.04 Interpret information on a fertilizer label.
- 15.05 Compare sources and forms of nutrients.
- 15.06 Determine methods of applying fertilizer materials.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

- 16.01 Recognize soil and plant conditions indicating irrigation needs, and develop an irrigation schedule.
- 16.02 Compare and select irrigation equipment and methods.
- 16.03 Install, operate, maintain, and repair irrigation equipment.

17.0 CONTROL PLANT PESTS--The student will be able to:

- 17.01 Identify common plant pests and their damages.
- 17.02 Describe life cycles of insects, pests, and diseases.
- 17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
- 17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--

The student will be able to:

- 18.01 Demonstrate basic facility maintenance, installation, or repair.
- 18.02 Safely operate, maintain, service, and repair equipment.
- 18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
- 18.04 Maintain and service small gasoline engines.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

- 19.01 Determine maturity, condition, and volume of crops to be harvested.
- 19.02 Describe procedures for harvesting crops.
- 19.03 Determine kinds and types of storage facilities for crops.
- 19.04 Grade, treat, pack, and/or store harvested crop.
- 19.05 Interpret and analyze market information.
- 19.06 Compare, select, and locate marketing channels, and develop a marketing program.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

- 20.01 Identify major sources of credit for agribusiness.
- 20.02 Complete a business-loan application.
- 20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.
- 20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

- 21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
- 21.02 Identify appropriate work and personal habits. Level I.
- 21.03 Identify appropriate work and personal habits. Level II.
- 21.04 Complete a job application.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July 1991

PROGRAM AREA: Agriculture

COURSE CREDIT: 1

PROGRAM TITLE: Agritechnology

PROGRAM NUMBER: 8106800

COURSE TITLE: Agriscience
Foundations

COURSE NUMBER: 8106810

COURSE DESCRIPTION:

This course was developed as a core and is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of pest management; principles of plant growth; management principles; agricultural marketing; and human-relations skills.

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF AGRICULTURE--The student will be able to:

- 01.01 Prepare an overview of the history of agriculture.
- 01.02 Discuss agricultural products and services important to the local, state, national, and global economy.
- 01.03 Investigate career opportunities in agriscience, and identify which school activities will help one prepare for those careers.
- 01.04 Discuss agriculture's role in the interaction of population, food, and energy.

02.0 APPLY IMPORTANT SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES--The student will be able to:

- 02.01 Discuss the importance of scientific classification in agriculture.
- 02.02 Use scientific methods to solve problems in agriculture.
- 02.03 Demonstrate the use of genetics, including probability applications, through an agricultural project/activity.
- 02.04 Analyze how recent technology is impacting agriscience.
- 02.05 Identify the components of an agricultural ecosystem and recognize the role of each.
- 02.06 Construct and analyze a diagram of a biological food chain common to Florida agriculture and natural resources.
- 02.07 Describe how water, carbon, nitrogen, oxygen, sulfur, and phosphorus are recycled naturally.
- 02.08 Evaluate soil profiles, land-capability classes, and soil-conservation practices.
- 02.09 List the components of Florida's freshwater systems (lakes, groundwater, aquifer, sinkholes, rivers, swamps), and explain the importance of managing these resources.

- 02.10 Explain how increasing or decreasing the use of one natural resource may affect another resource.
- 02.11 Describe the causes and effects of air, water, and land pollution, and identify ways to prevent pollution.
- 02.12 Explain the flow of energy from the sun, through agricultural systems (i.e., the common food pyramid), and back into the abiotic environment.
- 02.13 Recognize the environmental requirements necessary for a productive natural or man-made aquaculture system.
- 02.14 Apply principles of sound waste management to environmental problems common to agricultural systems.

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

- 03.01 List the most common causes of agricultural accidents.
- 03.02 Discuss the importance of following proper safety precautions.
- 03.03 Demonstrate safety procedures in the classroom and laboratory.
- 03.04 Describe the importance of following the directions on chemical containers and in equipment operator manuals.
- 03.05 Recognize the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR).
- 03.06 Demonstrate safe and effective use of laboratory equipment, instruments, and materials.

04.0 DEMONSTRATE THE USE OF TOOLS AND EQUIPMENT, AND DESCRIBE THE PRINCIPLES OF AGRICULTURAL MECHANICS--The student will be able to:

- 04.01 Describe the importance of using the proper tools and equipment for the job.
- 04.02 Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).
- 04.03 Demonstrate the ability to use an equipment manual.
- 04.04 Demonstrate the use of selected tools and equipment.
- 04.05 Service, maintain, and store tools, equipment, and supplies.

05.0 DESCRIBE THE PRINCIPLES OF PEST MANAGEMENT FOR INSECTS, DISEASES, AND WEEDS--The student will be able to:

- 05.01 Identify major types of pests and weed infestations.
- 05.02 Identify and select an appropriate control for each major type of pest, including the use of Integrated Pest Management.
- 05.03 Describe symptoms of pesticide poisoning.
- 05.04 Extract pertinent information from a pesticide label.
- 05.05 Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.
- 05.06 Clean and store pesticide-application equipment, safety clothing, and safety equipment.

- 05.07 Identify the proper disposal of containers and residual pesticides.
- 05.08 Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

06.0 DESCRIBE THE PRINCIPLES OF PLANT GROWTH AND REPRODUCTION--The student will be able to:

- 06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.
- 06.02 Describe the functions of roots, stems, leaves, and flowers.
- 06.03 Demonstrate sexual and asexual plant propagation.
- 06.04 Demonstrate the effects of nitrogen, phosphorus, and potassium (N.P.K.) on plant growth.
- 06.05 Extract pertinent information from a fertilizer label.
- 06.06 Describe the short- and long-range impact of fertilizer on people and the environment.

07.0 APPLY MANAGEMENT SKILLS AND ECONOMIC PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES--The student will be able to:

- 07.01 Identify basic economic principles applicable to agribusiness.
- 07.02 Explain the importance of local, state, and federal regulations and required documentation affecting agriculture.
- 07.03 Describe the types of agribusiness by organizational structure.
- 07.04 Select and use computer applications appropriate to agribusiness.
- 07.05 Form one or more inferences or hypotheses from records summarized in tables, graphs, or pictures.
- 07.06 Keep and maintain supervised agricultural experience (SAE) records.
- 07.07 Interpret legal descriptions of land in Florida.

08.0 EXPLAIN THE BASIC FUNCTIONS OF THE MARKETING PROCESS IN AGRICULTURE--The student will be able to:

- 08.01 Describe key factors in marketing agricultural products.
- 08.02 Select agricultural products according to grades and standards.

09.0 DEMONSTRATE HUMAN RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--The student will be able to:

- 09.01 Demonstrate acceptable work habits and attitudes.
- 09.02 Follow oral and written directions with understanding; form questions that clarify directions, as needed.
- 09.03 Communicate effectively in oral, written, visual, and nonverbal modes; demonstrate effective telephone skills.
- 09.04 Recognize and demonstrate reflective listening skills and assertive communications skills in the workplace.

09.05 Conduct small, informal, and group meetings.

09.06 Demonstrate a knowledge of the opportunities for leadership development available through an appropriate student organization.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July 1991

PROGRAM AREA: Agriculture

COURSE CREDIT: 1

PROGRAM TITLE: Agritechnology

PROGRAM NUMBER 8106800

COURSE TITLE: Agritechnology 1

COURSE NUMBER 8106820

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of agriscience-industry careers; prevention and treatment of livestock diseases; livestock anatomy; wholesale cuts of meat; animal reproduction and identification; animal safety; animal health certification; plant growth; plant fertilization; safe use of pesticides; maintenance of tools and equipment; record keeping; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

- 10.01 Investigate career opportunities in agriscience industries. Level I.
- 10.02 Describe training requirements for entry and advancement in agriscience careers. Level I.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

- 11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Level I.
- 11.03 Clean and disinfect animal equipment and facilities.
- 11.04 Explain proper disposal of animal waste with regard to sanitation, economics, and environmental implications.

12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION--The student will be able to:

- 12.01 Identify major parts of livestock and poultry anatomy.
- 12.02 Identify commercially important breeds of animals.
- 12.03 Describe desirable characteristics of breeding and market animals.
- 12.04 Identify wholesale cuts of beef, pork, lamb, and poultry.
- 12.05 Compare and select appropriate breeding methods for different agricultural enterprises.
- 12.06 Explain the reproductive cycles of commercially important animals.
- 12.07 Identify signs of animal pregnancy, parturition, and infertility.
- 12.08 Describe approved care for newborn animals.

- 12.09 Describe methods of permanent animal identification.
- 12.10 Describe methods of restraining, loading, handling, and transporting animals safely.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

- 13.01 Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.
- 13.04 Determine appropriate evaluation criteria for animals.
- 13.05 Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

14.0 COMPARE, SELECT, AND USE PLANT-PRODUCTION SYSTEMS--The student will be able to:

- 14.01 Compare different plant-production systems.
- 14.02 Propagate, grow, and transplant plants.
- 14.04 Select and prepare site and seed bed for planting.
- 14.05 Identify methods of pruning plants to achieve desired growth and to maintain health.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

- 15.04 Interpret information on a fertilizer label.
- 15.05 Compare sources and forms of nutrients.
- 15.06 Determine methods of applying fertilizer materials.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

- 18.03 Use and maintain hand tools and power equipment (e.g., power saws, welders).
- 18.04 Maintain and service small gasoline engines.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

- 20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g., depreciation, inventory, budgets).

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

- 21.01 Conduct group meetings using parliamentary procedure and public-speaking skills.
- 21.02 Identify appropriate work and personal habits. Level I.

STUDENT PERFORMANCE STANDARDS

EFFECTIVE DATE: July 1991

PROGRAM AREA: Agriculture

COURSE CREDIT: 1

PROGRAM TITLE: Agritechnology

PROGRAM NUMBER: 8106800

COURSE TITLE: Agritechnology 2

COURSE NUMBER: 8106830

COURSE DESCRIPTION:

This course is designed to develop competency in the areas of job and training requirements; professional organizations; application of medications to livestock; animal nutrition; feeds and feeding; marketing livestock; crop identification; planting crops; fertilizer calculations and application; irrigation; pest control; harvesting, packing, and grading crops; safe equipment operation; finance; and employability skills.

10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY--The student will be able to:

- 10.01 Investigate career opportunities in agriscience industries. Level II.
- 10.02 Describe training requirements for entry and advancement in agriscience careers. Level II.
- 10.03 Identify professional organizations and trade journals in the agriscience industry.

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION--The student will be able to:

- 11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Level II.
- 11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels.
- 11.05 Describe nutritional requirements of animals.
- 11.06 Formulate and compute least-cost feed rations.
- 11.07 Select growth stimulators and implants.
- 11.08 Determine feeding rates and methods of feeding animals.

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS--The student will be able to:

- 13.02 Collect and interpret market reports and identify market outlets for livestock.
- 13.03 Compare and select appropriate marketing systems.

14.0 COMPARE, SELECT, AND UTILIZE PLANT-PRODUCTION SYSTEMS--The student will be able to:

- 14.03 Identify varieties of local commercial plants and field crops.
- 14.06 Calculate planting rates and spacing; solve time, distance, area, and volume problems in agriscience.
- 14.07 Operate and adjust planting equipment.

15.0 FERTILIZE PLANTS AND CROPS--The student will be able to:

- 15.01 Develop fertilization schedule and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience.
- 15.02 Identify common nutrient-deficiency symptoms in plants.
- 15.03 Calibrate fertilization equipment and fertilize plants; solve time, distance, area, and volume problems in agriscience.

16.0 IRRIGATE PLANTS AND CROPS--The student will be able to:

- 16.01 Recognize soil and plant conditions indicating irrigation needs, and develop an irrigation schedule.
- 16.02 Compare and select irrigation equipment and methods.
- 16.03 Install, operate, maintain, and repair irrigation equipment.

17.0 CONTROL PLANT PESTS--The student will be able to:

- 17.01 Identify common plant pests and their damages.
- 17.02 Describe life cycles of insects, pests, and diseases.
- 17.03 Identify the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
- 17.04 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.

18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT--The student will be able to:

- 18.01 Demonstrate basic facility maintenance, installation, or repair.
- 18.02 Safely operate, maintain, service, and repair equipment.

19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS--The student will be able to:

- 19.01 Determine maturity, condition, and volume of crops to be harvested.
- 19.02 Describe procedures for harvesting crops.
- 19.03 Determine kinds and types of storage facilities for crops.
- 19.04 Grade, treat, pack, and/or store harvested crop.
- 19.05 Interpret and analyze market information.
- 19.06 Compare, select, and locate marketing channels, and develop a marketing program.

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE--The student will be able to:

- 20.01 Identify major sources of credit for agribusiness.
- 20.02 Complete a business-loan application.
- 20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies.

21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATION, AND HUMAN-RELATIONS SKILLS--The student will be able to:

- 21.03 Identify appropriate work and personal habits. Level II.
- 21.04 Complete a job application.

FACILITIES

Design Criteria

Listed below are the minimum, normal, and maximum space requirements for Agritechnology instructional programs according to the **Rules of the Florida State Board of Education (Florida Administrative Code), Ch. 6A-2.**

DEDICATED SPACE (in square feet)

	Per Student			Total (Based on 20 students)		
	Min.	Normal	Max.	Min.	Normal	Max.
Agriculture Production/ Processing Laboratory	122	128	134	2,440	2,560	2,680
A-7 Classroom Instruction				500	525	550
I-3 Lockers, Toilets, and Showers				140	150	160
M-1 Reference				190	200	210
P-1 Storage, Flammable				70	75	80
P-8 Storage, Material				165	175	185
S-7 Storage, Tool				260	275	290
Q-9 Storage, Machinery				1,000	1,100	1,200
Required Program Space				4,765	5,060	5,355

For further information on space, refer to S.B.E 6A-2.

Shop and Laboratory

Classroom/laboratory areas should be designed to accommodate Agritechnology workstations and equipment. Land laboratories may also be appropriate.

Suggested Equipment and Supplies

To provide instruction to meet the needs of future farm operators and workers in agribusiness and industry, adequate equipment, tools, and reference materials are necessary. Instructional programs will vary from one school to another. This fact makes it almost impossible to publish a basic list of equipment that will be adequate for all situations. Several factors influence the recommendation for tools and equipment necessary for instruction, including (1) the number of students, (2) the available space, (3) the local budget, and (4) the objectives.

air blowguns	cartridge respirators
air compressor, 3-horsepower	cattle-brush set
air hose	cattle-comb sets
anatomy sets	cattle feed troughs
animal clipper, electric	cattle pellet implanter
anvil with tools and accessories	cattle rack for pickup truck
artificial-insemination-equipment sets	C-clamps, 8-inch
auger bit sets	cement edger
augers, soil	cement groover
axes, single-bit	center punch set
back fat probe	chainsaw
battery bottle kit	chalk lines
battery cable puller	chop saw, metal cutting
battery carrier	circuit tester
battery charger	clamps, welding
battery hydrometer	cold chisel set
battery jumper cables	collections, feed mineral
battery-terminal brushes	collections, fertilizer
battery-terminal clamp spreader	collections, grass
bedding machine	collections, insect
bed press	collections, insecticide
benches, arc-welding	collection, soil-class
bolt cutter	collections, seed
bricklayer's jointer	combination squares
brick trowel	come-along
broadcast seeder	conduit bender
brushes, welder's	corral, portable
brush set, parts-cleaning	counter-brush set
budding knives	creepers
calf puller	creep feeder
capas and bibs, leather	cultivator
carbon arc torch	dehorner, power

disk
drawknives
drencher
drill press
drill-press vise
drill set, masonry
drill sets, 9/16-1-inch high-speed
drill sets, 1/16-1/2-inch high-speed
duster, hand
ear notcher
ear-tag tool
elastators
electric drill, 1/2-inch HD
electric drill, 3/8-inch HD
emasculator
engraving tool, electric
expansion bit sets
extension cords, 100-foot, heavy-duty
farrowing houses, portable
fence charger, electric
fence stretcher
fence tools
fertilizer spreader
file sets
first-aid kits
flaring tool
float
folding rules
forage sample
forks, manure
framing squares
freeze-branding-equipment sets
front-end loader
funnel, tractor fuel
gasoline cans, 5-gallon safety
gauges, feeler
gauge, tire
germinator
gloves, leather
goggles, eye
grafting tools
grain drill
grease guns, hand
grinder, pedestal
hacksaws
halters
hammers, chipping
hammer set

hand truck
hatchets
hay rack
helmets, welding
hoe, mortar
hoes, garden
hog ringers
horse-brush set
hot-branding equipment sets
hot shots
injector, fertilizer
ladder, extension
land-measuring wheel
leveling blade
levels, carpenter's
levels, hand-sighting
load binder
loading chute for cattle (port)
loading chute for swine
lubrication-equipment set
machetes with sheaths
magnifiers, hand
mallet set, wooden
map measurer
microscopes
mineral feeder
mower
mulch layer, plastic
nipper, end
nipper, hoof
nipper, tooth
obstetrical chains
oilcan
oiler, general-purpose
oiler, insecticide
oilers, cattle
oilers, swine
oil tappers
oily waste cans
paint-brush set
pickup truck
pipe cutter
pipe die
pipe vise
planter
plant presses
pliers set
pliers set, vise-grip

plow, disk
 plow, moldboard
 plumb bob
 posthole diggers
 pregnancy-testing kit
 pry bars
 radial arm saw, 12-inch
 rakes, garden
 rakes, potato
 ratchet braces
 refrigerator
 sander
 saw, circular
 sawhorse brackets
 saw, portable electric
 saws, hand crosscut
 saws, pruning
 scale, platform
 scale, portable animal
 screens, arc-welding
 screwdriver set, Phillips
 screwdriver set, standard
 seed sower, hand
 sharpening stones
 shears, lopping
 shears, pruning
 shelving set, steel
 shovels, round-point
 shovels, square-point
 show sticks
 sieve, seed
 sieve, soil
 slappers, canvas
 sledgehammer
 socket set, metric
 socket set, 1 1/16-2-inch SAE
 socket set, 1/8-1 1/16-inch SAE
 soil-profile sampler
 soil-test kit
 soil thermometer
 soldering kit
 splicer, fence-wire
 sprayer
 sprayer, herbicide
 sprayers, 5-gallon
 squeeze chute for cattle
 squeeze chute for swine
 stepladder

sterilizer, soil
 stock cart
 stud removers
 swine pens, portable
 tally meters
 tap-and-die set
 tape measures, 100-foot steel
 tattoo set, animal
 tester, antifreeze
 tester, crop moisture
 tester, tissue
 thermometer, animal
 thermometer, recording
 thermostat
 timing light
 tip cleaners
 tire-fluid adapter
 tire-valve tool
 tool cabinet
 towing chain with two hooks
 tractor
 trailer, livestock
 trouble lights, heavy-duty
 vacuum cleaner, all-purpose
 vises, machinist's
 vises, woodworking
 wagon
 water cans, 5-gallon
 water hoses, 50-foot
 water trailer
 water troughs with automatic float
 weed collections
 welders, mig
 welders, 300-500 AMP AC-DC
 welding benches, oxyacetylene
 welding carts, oxyacetylene
 welding goggles, oxyacetylene
 welding outfits, oxyacetylene
 wheelbarrow
 wheel dresser for grinder
 wire-brush set
 wire-brush set for electric drill
 wood-chisel set
 workbenches
 workbenches, shop
 wrecking bars
 wrench, oil-filter
 wrench set, metric combination

wrench sets, adjustable
wrench set, SAE combination

wrench sets, Allen
wrench sets, pipe

Classroom

Classroom resources, including equipment and supplies, should be provided and utilized to enable the instruction to meet program objectives. Such equipment may include, but is not limited to:

acetate (for transparencies)
adding machine
blackout curtains
bulletin files, legal-size, with dividers
and inserts
bulletin files, letter-size
cabinet, glassfront display
cabinet, storage, for slides and
filmstrips
cabinet, storage, for transparencies
cassettes
chairs, straight, 20
chairs, swivel
desk, teacher's
file cabinet, 4-drawer
file folders and labels
filmstrip previewer
filmstrip projector
macroscope
magazine rack
microcomputer with monitor, CD ROM
drive, printer, telecommunication link,
and modem
notebook rack
paper clips
paper, microcomputer printer
paper, photocopy

paper punch, 3-hole
pencils (grease) or pens (transparency)
projection screen, 70-inch
projector, overhead
projector, slide with timer and
speaker's lectern
ribbons, microcomputer printer
rubber bands
rulers
scissors
slide previewer
stereoscope (microscope)
storage, cabinets, 36-inch x 21-inch x
78-inch
synchronizer
tables, classroom, 30-inch x 60-inch
tables, projection
tables, two-person work and study, 10
table, typewriter
table, wet demonstration
tape and tape dispenser
tape recorder
thumb tacks
towels, paper
typewriter
VCR equipment (player, monitor, and
camera)

Safety

Although no specific safety regulations have been mandated for Agritechnology programs, it is suggested that strict adherence to the general standards contained in the Florida Department of Education *Educational Facilities: Public Schools & Community Colleges Rules of Florida State Board of Education (Administrative Code)*, Ch. 6A-2, be practiced (e.g., first-aid kits in classrooms, adequate fire extinguishers, fire-evacuation plan). In addition, since working with livestock,

machinery, and other agriculture-related facilities is an integral part of this program, special efforts must be made to ensure student safety and well-being. Humane treatment of livestock should also be ensured.

S.B.E. Rule 6A-2.097. Safety devices in shops, laboratories, and other process areas:

- (1) Use of personal protection devices and other protective equipment is required when persons are exposed to the following:
 - (a) Arc welding, heavy gas cutting, scarfing.
 - (b) Spot welding, brazing, or cutting.
 - (c) Machining of any materials causing flying chips.
 - (d) Injurious radiations, dusts, fumes, gases, vapor mists.
 - (e) Sledging, hammering, chipping, scaling, drilling, grinding, chiseling, wire brushing, and caulking operations where flying objects or particles may strike the body.
 - (f) Chemicals, acids, caustics, and molten metals.
- (2) Personal protection devices which come in contact with the skin shall be sanitized after each use.
- (3) Clothing, jewelry and personal grooming of personnel in shops and labs shall not constitute a hazard.
- (4) Individual equipment power shut-off, within reach of the operator, shall be provided for all working machinery. Each individual machine shall be equipped with an approved electromagnetic starter switch.
- (5) No safeguard, safety appliance, or safety device guarding a machine or machine part shall be removed or made ineffective except when the machine is stopped and for the purpose of immediate cleaning, repairing or adjusting. Upon completion of repairing, cleaning or adjusting, such guard, appliance, or device shall immediately be relaced. Any shop or laboratory tool or equipment found to be unsafe shall be red-tagged and removed from service until the condition is corrected.
- (6) The floors in areas where machines are used shall be kept free from waste, grease, and obstructions.
- (7) Welding operations shall be located in a shielded area, and the area shall be free of combustible material and persons not wearing protective devices. Fume removal and venting to the exterior shall be provided.
- (8) Areas where toxic fumes are produced shall be properly vented to the outside.
- (9) Flammable fumes or dust produced in a student occupied facility shall be mechanically exhausted to the outside with approved explosion-proof motor driven equipment of sufficient capacity to effectively remove fumes or dust and with filters in place.
- (10) Each space equipped with unprotected gas valves accessible to students shall have an approved master cut-off readily accessible to the instructor.
- (11) Each shop or lab equipped with electrically powered machinery accessible to students shall have one (1) or more conspicuously color-coded emergency disconnect switches at convenient locations throughout the space. Ordinary office machines, domestic sewing machines, and other such nonhazardous machines are not included in this requirement.

- (12) Kilns shall be properly shielded from combustibles, combustible surfaces and personnel, and shall not be located in the path of or adjacent to any means of egress, or exposed to unauthorized persons.
- (13) Automotive, body and frame repair areas requiring welding and cutting shall be separated from engine overhaul and related fuel handling activities.
- (14) A tire cage shall be provided when pressurizing tires on split rims.
- (15) Vehicle lifts shall be provided with a mechanical safety lock.
- (16) Piping and working machinery shall be identified as follows:
 - (a) Piping systems, except domestic hot and cold water, shall be visibly identified by legend, flow arrows and color coding in accordance with ANSI A13.1, American National Standard Scheme for Identification of Piping Systems, 1981 (see Rule 6A-2.050, FAC). Purchased, preprinted pipe markers meeting the above requirements and applied per manufacturer's instructions are acceptable. Field stenciling, when used, may delete color coding when legend clearly identifies pipe contents and flow arrows are included.
 - (b) Working machinery and component parts shall be safety color-coded per ANSI Z53.1, American National Standard Safety Color Code for Marking Physical Hazards, 1979 (see Rule 6A-2.050, FAC).
- (17) The safety color-coded chart shall be posted in a conspicuous place available to employees and students.
- (18) Hazardous work and storage areas shall be identified by appropriate caution signs.
- (19) All equipment designed to be permanently mounted shall be securely fastened to its supporting surface.
- (20) Safety zone lines shall be used on the floor area surrounding working machinery.
- (21) Fume hoods shall be provided and kept in proper operating condition. Operations where flammable gas, toxic vapors or noxious odors are given off shall be performed in fume hoods specifically designed for the intended use.
- (22) Safety equipment such as showers and floor drains, eye wash, fire blankets and proper extinguishing equipment shall be provided in areas where dangerous chemicals are used by students, and shall be properly installed and maintained. Specific Authority 229.053(1), 235.01(2) FS. Law Implemented 235.01, 235.014(11), 235.06, 235.26, 240.327 FS. History--New 6-10-75, Amended 9-6-78, 6-21-83, Formerly 6A-2.97, Amended 4-10-86.
- c.f. ANSI Z53.1, American National Standard Safety Color Code for Marking Physical Hazards, 1979.
ANSI A13.1, American National Standard Scheme for the Identification of Piping Systems, 1981

PROGRAM IMPLEMENTATION

Agriculture Enhancement Teaching-Learning Plans

Teaching-learning plans are designed for teacher use in managing instruction. Through the pilot project for the enhancement of vocational agriculture education, **teaching-learning plans** have been developed for each SPS in this program. These plans include the appropriate intended outcome and SPS, the enabling objectives, which clarify what students will know or be able to do, the equipment/tools/materials needed to teach the SPS, suggested references and texts, teaching and learning activities for the classroom and the laboratory, and three sample test items. These materials are available through the occupational program specialist at DVACE. A sample is included in Appendix A.

Student Learning Guide

A student learning guide provides students with directions to help them manage their own learning. Tasks are broken down into steps, and resources as well as self-checks are provided.

A sample student learning guide is provided in Appendix B as an example for you to use when developing or adapting a set of learning guides or modules. This sample guide presents the major components of a competency-based student learning guide. For further information, see the *Florida Vocational Program Implementation Guide*.

Student Organization Participation

The vocational student organization associated with the Agritechnology program is FFA. This organization is cocurricular, and participation is considered an integral part of the instructional program.

Refer to the *Florida Vocational Program Implementation Guide* for more information.

PROFESSIONAL CONSIDERATIONS_____

Teacher Certification

Listed below are the certification coverages included in the current *Course Code Directory* for Agritechnology:

VOC AGRI @4; AGRI @4; AGRI PROD #7; AGRICULTUR 1 2

Professional Organizations and Support Services

Abraham Baldwin Agricultural College
ABAC Station
Tifton, GA 31793

Commissioner of Agriculture
Capitol Building
Tallahassee, FL 32301

Dairy Farmers, Inc.
P.O. Box 7854
Orlando, FL 32804

Department of Agricultural and Extension Education
305 Rolfs Hall
University of Florida
Gainesville, FL 32611

Division of Vocational, Adult, and Community Education
Florida Department of Education
Florida Education Center
Tallahassee, FL 32399

Florida A&M University
M. L. King, Jr., Boulevard
Tallahassee, FL 32307

Florida Association of Conservation Districts
P.O. Box 1269
Gainesville, FL 32602

Florida Association, FFA
Suite 1224, Florida Education Center
325 West Gaines Street
Tallahassee, FL 32399-0400

Florida Beef Cattle Improvement Association
University of Florida
Gainesville, FL 32611

Florida Beef Council
P.O. Box 1929
Kissimmee, FL 32741

Florida Cattlemen's Association
P.O. Box 1929
Kissimmee, FL 32741

Florida Council of Farmer Cooperatives
P.O. Box 730
Gainesville, FL 32602

Florida Farm Bureau Federation
P.O. Box 730
Gainesville, FL 32602

Florida FFA Foundation
First Florida Bank Building
150 3rd Street, Southwest
Winter Haven, FL 33880

Florida Forestry Association
P.O. Box 1696
Tallahassee, FL 32302

Florida Fruit and Vegetable Association
P.O. Box 20155
Orlando, FL 32814

Florida Irrigation Society
6500 Eloise Loop Road
Winter Haven, FL 33880

Florida Pork Improvement Group
P.O. Box 730
Gainesville, FL 32602

Florida Poultry Federation, Inc.
5415 Mariner Street, Suite 105
Tampa, FL 33609

Florida Quarter Horse Association
P.O. Box 756
Nokomis, FL 33555

Florida Retail Federation
P.O. Box 10024
Tallahassee, FL 32302

Florida Santa Gertrudis Association
Star Route 1
DeBary, FL 32713

Florida Vocational Agriculture Teachers Association
(address rotates with officers)

Instructional Materials Service
305 Rolfs Hall
University of Florida
Gainesville, FL 32611

INSTRUCTIONAL RESOURCES

Listed on the following pages are teacher-recommended materials for teaching Agritechnology. If you are interested in obtaining any of the materials, refer to the source listing that follows or to the list of professional organizations.

Teacher-Recommended Materials

NONPRINT

<u>Title</u>	<u>Format</u>	<u>Source*</u>	<u>Year</u>
<i>AgEd Network</i>	Online Database Service	Agridata Resources, Inc.	1984
<i>Alpha Four</i>	CS**	Alpha Software Corp.	nd
<i>Automechanics Shop Safety</i>	CS	Shopware Educational Systems	nd
<i>CompuServ</i>	Online Database Service	CompuServe Information Service	nd
<i>Daceasy Accounting</i>	CS	Daceasy, Inc.	nd
<i>Florida Pest Control Guides</i>	CS	IFAS	1988
<i>Learndos</i>	CS	Microsoft Corp.	1988
<i>Lotus 1,2,3</i>	CS	Lotus Development Corp.	nd
<i>Lotus Magellan</i>	CS	Lotus Development Corp.	nd

*The source listed for each title provides only one option for obtaining materials. It is not the only source, nor does its listing represent an endorsement.

**Computer Software

<u>Title</u>	<u>Format</u>	<u>Source</u>	<u>Year</u>
<i>Memorymate</i>	CS	Broderbound	nd
<i>Micrograde</i>	CS	Chariot Software Group	nd
<i>Microtest</i>	CS	Chariot Software Group	nd
<i>Moneycounts</i>	CS	Parsons Technology	nd
<i>Ortho's Computerized Gardening</i>	CS	Ortho Information Services	nd
<i>PC File 5.0</i>	CS	Buttonware	nd
<i>PC Tools Deluxe</i>	CS	Buttonware	nd
<i>PFS: First</i>	CS	Software Publishing Corp.	nd
<i>Popdrop</i>	CS	Bloc Publishing Corp.	1988
<i>Portable Woodworking Equipment</i>	CS	Shopware Educational Systems	nd
<i>Procom+</i>	CS	Datastorm Technologies	1986
<i>Shop Inventory</i>	CS	Shopware Educational Systems	nd
<i>Stationary Woodworking Equipment</i>	CS	Shopware Educational Systems	nd
<i>Welding Equipment, Safety and Operations</i>	CS	Shopware Educational Systems	nd

<u>Title</u>	<u>Format</u>	<u>Source</u>	<u>Year</u>
<i>WordPerfect</i>	CS	WordPerfect Corp.	1988
<i>WordPerfect Executive</i>	CS	WordPerfect Corp.	nd
<i>Wordstar</i>	CS	MicroPro International Corp.	1985

PRINT

The following teacher-recommended print materials were produced at the University of Illinois. They constitute the Illinois Agricultural Core Curriculum Revision Units.

Central Core Cluster

- Unit A: Agricultural Literacy*
- Unit B: Generalizable Skills in Agricultural Occupations*
- Unit C: Basic Principles of Agricultural Science*
- Unit D: Basic Agribusiness Principles and Skills*
- Unit E: Developing Leadership Capabilities in Agriculture/Agribusiness*
- Unit F: Supervised Experience in Agriculture/Horticulture*

Agricultural Business and Management Cluster

- Unit A: Agribusiness Operation and Management*
- Unit B: Animal Science*
- Unit C: Plant and Soil Science*
- Unit D: Food Science and Technology*
- Unit E: Agricultural Engineering/Mechanization*

Horticulture Cluster

- Unit A: Horticultural Business Operation and Management*
- Unit B: Horticultural Science and Production*
- Unit C: Horticultural Mechanics*
- Unit D: Landscaping*
- Unit E: Floral Design*

Agricultural Resources Cluster

- Unit A: Environmental Protection*
- Unit B: Forestry*

Unit C: Fish and Wildlife Management
Unit D: Outdoor Recreation

Listed on the following pages are selected sources of materials that are available for Agritechnology. Additional resources may be available from other sources, including professional and trade organizations. You are encouraged to seek catalogs from these firms so that you become familiar with available materials.

Sources of Print and Audiovisual Materials and Software

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
Agridata Network 205 West Highland Avenue Milwaukee, WI 53203	X	--	X
American Association for Vocational Instructional Materials 745 Gaines School Road Athens, GA 30605	X	X	--
American Society of Agricultural Engineers 2950 Niles Road Saint Joseph, MI 49085-9659	X	--	--
American Vocational Association Agricultural Education Division 1410 King Street Alexandria, VA 22314	X	--	--
Alpha Software Corporation 30 B Street Burlington, MA 01803	--	--	X
Bloc Publishing Corporation P.O. Box 18058 Cleveland, OH 44118	X	--	--
Broderbund Systems, Inc. 17 Paul Drive San Rafael, CA 94903	--	--	X
Buttonware P.O. Box 5604 Bellevue, WA 98006	--	--	X

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
Center for Occupational Research and Development (CORD) 601 C Lake Air Drive Waco, TX 76710	X	--	--
Chariot Software Group 3659 India Street, Suite #100 San Diego, CA 92103	--	--	X
CompuServ Information Service 5000 Arlington Center Boulevard Columbus, OH 43220	--	X	--
Conservative Foundation 1250 24th Street, Northwest Washington, DC 20037	X	--	--
Cornell University Instructional Materials Service Department of Education Academic I, Cornell University Ithaca, NY 14853	X	X	--
Datastorm Technologies, Inc. P. O. Box 1417 Columbia, MO 65205	--	--	X
Dec Easy Software 17950 Preston Road, Suite #800 Dallas, TX 75252	--	--	X
Delmar Publishing, Inc. 2 Computer Drive, West Albany, NY 12212-5015	X	--	--
Diamond Farm Book Publishers Box 537 Alexandria Bay, NY 13607	X	--	--
Doubleday and Company, Inc. 501 Franklin Avenue Garden City, NY 11530	X	--	--
Encyclopaedia Britannica Educational Corporation 310 South Michigan Avenue Chicago, IL 60604	X	--	X

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
Florida Department of Agriculture Division of Forestry Collins Building Tallahassee, FL 32301	X	--	--
Florida Department of Education Division of Vocational, Adult, and Community Education Bureau of Career Development Florida Education Center Tallahassee, FL 32399	X	--	--
Florida Department of Natural Resources Marjory Stoneman Douglas Building 3900 Commonwealth Boulevard Tallahassee, FL 32303	X	--	--
Florida State University Center for Instructional Development and Services (CIDS) 2003 Apalachee Parkway Tallahassee, FL 32301	--	X	--
Hobar Publications 1234 Tiller Lane St. Paul, MN 55112	X	--	X
Interstate Printers and Publishers 19 North Jackson Street Danville, IL 61832	X	--	--
Iowa Curriculum Assistance System College of Education N008 Lagomarcino Hall Iowa State University Ames, IA 50011	X	--	--
John Deere Company 1400 Third Avenue Moline, IL 61265	X	--	--
John Wiley & Sons One Wiley Drive Somerset, NJ 08873-1272	X	--	--

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
Lotus Development Corporation 55 Wheeler Street Cambridge, MA 02138	--	--	X
Micropro International Corporation 33 San Pablo Avenue San Rafael, CA 94903	--	--	X
MicroSoft Corporation 16011 Northeast 6th Way Redmond, WA 98073	--	--	X
Mid-America Vocational Curriculum Consortium (MAVCC) 1500 West Seventh Avenue Stillwater, OK 74074	X	--	--
Modern Talking Picture Service 5000 Park Street North St. Petersburg, FL 33709	--	X	--
National Geographic Society Educational Services Department 81 Washington, DC 20036	X	X	--
National Parks and Conservation Association 1701 18th Street, Northwest Washington, DC 20009	X	X	--
National Teaching Aids, Inc. 120 Fulton Avenue Garden City Park, NY 11040	X	X	--
National Wildlife Federation 1412 16th Street, Northwest Washington, DC 20036	X	--	--
Natural Resources Defense Council, Inc. 122 East 42nd Street New York, NY 10168	X	--	--

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
NNCCVTE, Southeast Region Research Curriculum Unit Drawer DX Mississippi State, MS 39762	X	--	--
Occupational Awareness P. O. Box 948 Los Alamitos, CA 90720	X	--	--
Ohio State University Instructional Materials Lab 842 West Goodale Boulevard Columbus, OH 43212	X	X	--
Ortho Information Service Division of Chevron Chemical Company P. O. Box 5047 San Ramon, CA 94583	--	--	X
Parsons Technology 375 Collins Road, Northeast Cedar Rapids, IA 52402	--	--	X
Photocom P. O. Box 3135 Pismo Beach, CA 93448-1135	--	X	--
Prentice Hall/Reston Publishing Route 9W Englewood Cliffs, NJ 07632	X	X	X
SHOPWARE Educational Support Department Esc Route 1, Box 330-E Aberdeen, WA 98520-9984	--	--	X
Soil and Water Conservation Society 7515 Northeast Ankeny Road Ankeny, IA 50021-9764	X	--	--
Superintendent of Documents U.S. Government Printing Office Washington, DC 20402	X	--	--

	<u>Print</u>	<u>Audiovisual</u>	<u>Software</u>
Texas A&M University Instructional Materials Service FE Box 2588 College Station, TX 77843-2588	X	X	--
University of Illinois Vocational Agriculture Service 1401 Maryland Drive Urbana, IL 61801	X	X	--
University of North Carolina Press P. O. Box 2288 Chapel Hill, NC 27515-2288	X	--	--
Vocational Education Productions California Polytechnic State University San Luis Obispo, CA 93407	X	--	--
V-TECS Curriculum Publications Clearinghouse Western Illinois University Horrabin Hall 46 Macomb, IL 61455	X	--	--
WordPerfect Corporation 1555 North Technology Way Orem, UT 84057	--	--	X

FEIS Services

FLORIDA EDUCATIONAL INFORMATION SERVICE
2003 Apalachee Parkway
Tallahassee, FL 32301
(904) 487-2054

If you need (1) information about copyright; (2) a list of instructors teaching Agricultural Production programs in Florida; (3) journal articles or project reports on specific topics; (4) curriculum and instructional materials; or (5) information on current trends, issues, and research, please contact the Florida Educational Information Service (FEIS), Center for Instructional Development and Services, College of Education, Florida State University, 2003 Apalachee Parkway, Tallahassee, Florida 32301; (904) 487-2054. FEIS will tailor its services to meet your needs for information concerning resource materials.

APPENDIX A

Sample Teaching-Learning Plans
for Agritechnology

Agriculture Enhancement Teaching-Learning Plans

Teaching-learning plans are designed for teacher use in managing instruction. Through the pilot project for the enhancement of vocational agriculture education, **teaching-learning plans** have been developed for each SPS in this program. These plans include the appropriate intended outcome and SPS, the enabling objectives, which clarify what students will know or be able to do, the equipment/tools/materials needed to teach the SPS, suggested references and texts, teaching and learning activities for the classroom and the laboratory, and three sample test items. These materials are available through the occupational program specialist at DVACE.

PROGRAM TITLE: Agritechnology

COURSE TITLE: Agriscience Foundations

INTENDED OUTCOME: 06.00 Describe the principles of plant growth and reproduction.

STUDENT PERFORMANCE STANDARD: 06.04 Demonstrate the effects of NPK (nitrogen, phosphorus, potassium) on plant growth.

ENABLING OBJECTIVES:

1. Identify different formulations of fertilizers (soluble, granular, slow release).
2. Describe the carbon and the nitrogen cycles.
3. Identify nutritional deficiencies.
4. Calculate parts per million (ppm).
5. Define pH.

EQUIPMENT/TOOLS/MATERIALS NEEDED:

fertilizer, injector, plants to be fertilized, rubber gloves, books, and visuals

TEACHING-LEARNING ACTIVITIES (CLASSROOM OR LAB):

1. Mix soluble fertilizer for injector at a rate that will give 200 ppm delivered.
2. Apply granular fertilizer at the proper rate and slow-release fertilizer at the proper rate.
3. Locate examples of nitrogen deficiency in the laboratory.
4. Diagram the carbon and nitrogen cycles.
5. Read pages 35-41 in the book *Ornamental Horticulture* by Reiley and Shry.
6. Read pages 37-55 in the booklet *Container Growing*. (IFAS)
7. View filmstrip/tape *Fertilizing Ornamental PLants*. (VEP)
8. View filmstrip/tape *Plant Nutrition*. (Prentice-Hall)
9. View filmstrip/tape *Need for Fertilizers*. (Prentice-Hall)

SAMPLE TEST ITEMS OR PERFORMANCE CHECKLIST:

1. The brown edges of older leaves indicate a deficiency of what plant nutrient?
 - A. magnesium
 - B. manganese
 - C. phosphorus
 - D. potassium*

2. An excess of which of the following plant nutrients can cause the production of excessive vegetative growth at the expense of fruitset?
- A. nitrogen*
 - B. phosphorus
 - C. potassium
 - D. zinc
3. What is neutral on the pH scale?
- A. 4.0
 - B. 6.0
 - C. 7.0*
 - D. 9.0
4. What are nutrients that are needed in large quantities called?
- A. macronutrients*
 - B. micronutrients
 - C. minor nutrients
 - D. trace nutrients
5. One function of nitrogen is to
- A. increase the crop yield.*
 - B. produce plumper seeds.
 - C. speed the decay of organic matter.
 - D. stimulate root growth.
6. Which of the following commercial sources of potassium is the most common?
- A. muriate of potash*
 - B. nitrate of potash
 - C. sulfate of potash
 - D. sulfate of potash-magnesia

PROGRAM TITLE: Agritechnology **COURSE TITLE:** Agritechnology I

INTENDED OUTCOME: 11.0 Provide for animal health and nutrition.

STUDENT PERFORMANCE STANDARD: 11.01 Recognize and describe the prevention and treatment of common animal diseases, disorders, and pests.

ENABLING OBJECTIVE:

Identify the disease when given the symptoms, species affected, and treatment and control.

EQUIPMENT/TOOLS/MATERIALS NEEDED:

objectives, information sheets, test

TEACHING-LEARNING ACTIVITIES:

1. Match terms associated with livestock diseases to their correct definitions.
2. Classify diseases as infectious, noninfectious, or nutritional.
3. List the steps necessary for a successful brucellosis-eradication program.
4. List the ways cattle may become infected with brucellosis.
5. List several ways swine cholera may be spread.
6. List items that will help in the control of swine cholera.
7. Identify the disease when given the species affected, symptoms, and treatment and control.

SAMPLE TEST ITEM OR PERFORMANCE CHECKLIST:

1. What diseases can cause a cow to give birth prematurely and to retain the afterbirth?
 - A. anthrax
 - B. brucellosis*
 - C. malignant edema
 - D. vaginitis
2. All weaning-aged calves should be vaccinated for *Clostridium chauvoei*, better known as:
 - A. blackleg*
 - B. Black's disease
 - C. foot-and-mouth disease
 - D. foot rot

3. What hog disease has been eradicated by a state and federal program?

- A. cholera*
- B. erysipelas
- C. parturient paresis
- D. streptococcic septicemia

PROGRAM TITLE: Agritechnology **COURSE TITLE:** Agritechnology II

INTENDED OUTCOME: 11.0 Provide for proper animal health and nutrition.

STUDENT PERFORMANCE STANDARD: 11.02 Read, interpret, and follow directions on pesticides, medication, and other additive labels.

ENABLING OBJECTIVES:

1. Select from a list four agencies that regulate animal health.
2. Read and interpret a label to use the proper medication for specific health problems.
3. Read and interpret label to use proper amount of medication for specific health problems.
4. Identify kinds of injections.
5. Identify various effects of medications.

EQUIPMENT/TOOLS/MATERIALS NEEDED:

information sheets, assignment sheets, transparency master, test sheets

TEACHING-LEARNING ACTIVITIES (CLASSROOM OR LAB):

1. Read directions.
2. Study information sheets.
3. Complete assignment sheets.
4. Take test.
5. Explain various methods of treating animal health problems.

SAMPLE TEST ITEM OR PERFORMANCE CHECKLIST:

1. Where are subcutaneous injections made?
 - A. in a vein
 - B. under the skin*
 - C. between layers of skin
 - D. in the body cavity
2. Which of the following is *not* a means of administering drugs orally?
 - A. drench
 - B. balling gun
 - C. pills
 - D. infusion*

3. The purpose of vaccination is to

- A. prevent parasites.
- B. prevent diseases.*
- C. control parasites.
- D. treat diseases.

APPENDIX B

Sample Student Learning Guide
for Agritechnology

ABOUT STUDENT LEARNING GUIDES _____

As mentioned in the Instructional Approach section of the *Florida Vocational Education Program Implementation Guide*, competency-based vocational instruction (CBVI) is the most appropriate instructional approach to teaching students to become competent workers. In order to implement CBVI effectively and efficiently, you and the students should have access to competency-based instructional materials, such as student guides or modules.

The following components are often included in a student learning guide:

The **introduction** includes the intended outcome, the SPS for which the guide is developed, and an introduction to the guide, stating why this topic is important to study and what this guide is about (other information, such as the relationship between this guide and other guides, can be included on this sheet also).

Objectives include both knowledge and performance objectives if the SPS calls for hands-on performance, but only knowledge objectives if the SPS requires knowledge-oriented competencies.

Resources include the instructional materials that students should use to study and the tools and supplies that students should have access to in order to complete this guide.

Learning activities include a list of steps that students should follow in order to master the objectives.

The **self-check** consists of questions designed to help students review what they have studied.

The **activity sheet** is designed to help students practice hands-on tasks for performance objectives. (If the SPS does not require hands-on activity, this sheet is not included in the learning guide.)

Information sheets provide information, guidance, or summaries not available elsewhere. These are usually instructional resources for the knowledge objectives.

The **written test** measures student achievement on the knowledge objectives.

The **performance test** is designed to be used by the evaluator/instructor to assess the student's level of achievement on the performance objectives.

The student learning guide may consist of two or more sets of the above components if the objectives need to be divided into two or more groups. Whatever format you use for the student learning guide, these components should be included in order to provide for instructional events such as:

1. gaining attention
2. stating objectives
3. recalling prerequisites
4. providing instructional stimulus
5. providing learning guidance
6. eliciting performance
7. providing feedback
8. assessing performance
9. enhancing retention and transfer

STUDENT LEARNING PACKAGE NO.

Horticulture Department
Sarasota County Vocational Center
4748 Beneva Road / Sarasota, Florida 33583
(813) 924-1365

CORE



Horticulture

When you successfully **complete** this learning package, you will be able to

TASK:

INTERPRET INFORMATION IN A PESTICIDE LABEL

Why is it **important** for you to learn this task?

INTRODUCTION:

ANYONE USING PESTICIDES HAS THE RESPONSIBILITY TO HIMSELF OR HERSELF, AND TO OTHERS, TO FOLLOW PROCEDURES THAT AVOID UNNECESSARY HAZARDS TO PEOPLE, ANIMALS, OR THE ENVIRONMENT. IT IS SPECIALLY IMPORTANT THAT REGULAR USERS OF PESTICIDES BE WELL INFORMED AND FOLLOW APPROVED PRACTICES TO AVOID THE CUMULATIVE EFFECT OF LOW-LEVEL CONTAMINATION.

To show that you have **Mastered** this task, here is what you will be asked to do

PERFORMANCE OBJECTIVE:

You Will Be Given: INSTRUCTION SHEETS, REFERENCES, SLIDES AND PESTICIDE LABELS

You Must: DESCRIBE PESTICIDE FORMULATIONS AND INTERPRET PESTICIDE LABEL INFORMATION

How well: MINIMUM GRADE OF 80% IN KNOWLEDGE AND PERFORMANCE TESTS.

Here is what you will be able to do when you complete each **Section** of this learning package

SECTIONS:

1. DESCRIBE PESTICIDE FORMULATIONS
2. INTERPRET INFORMATION IN PESTICIDE LABEL

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DUTY NO. 00000
TASK NO. 0601

PROGRAM NO.
CORE

PREREQUISITE

AVERAGE
HOURS

DATES
REVISED

1988

SECTION NO.

When you complete this Section, you will be able to:

1. DESCRIBE PESTICIDE FORMULATIONS
2. INTERPRET INFORMATION IN PESTICIDE LABEL

Complete each of the Learning Activities listed below

LEARNING ACTIVITIES

DO the following things:

USE the following resources:

1. Read and study instruction sheet

1. SCVC Instruction Sheet No. 1
"PESTICIDE FORMULATIONS"

2. Read reference

2. "APPLYING PESTICIDES CORRECTLY,
A guide for Private and Commer-
cial Applicators", pages 23-28

3. Complete self check and turn it
in

3. Self Check No. 1
"DESCRIBE PESTICIDE FORMULATIONS"

4. Read and study instruction sheet

4. SCVC Instruction Sheet No. 2
"INTERPRETING INFORMATION IN
A PESTICIDE LABEL"

5. View slides

5. Slides/script set No. 206
"THE PESTICIDE LABEL"

6. Complete self check and turn it
in

6. Self Check No. 2
"INTERPRET INFORMATION IN LABEL"

7. Take Performance Test

7. Performance Test No. 1
"INTERPRET INFORMATION IN A
PESTICIDE LABEL"

Prog.	Duty	Task	Page
CORE	0600	0601	2

INSTRUCTION SHEET :

PESTICIDE FORMULATIONS

The main reference for this module is the publication APPLYING PESTICIDES CORRECTLY, A GUIDE FOR PRIVATE AND COMMERCIAL APPLICATORS. The subject of pesticide formulations is covered in pages 23 to 28. The notes in this instruction sheet are to supplement the reference listed. Check pages 126 to 128 of the reference for the meaning of terms used in pest control.

An emulsion is a mixture of two liquids, such as oil and water. Since normally oil and water separate, in order to maintain these two liquids mixed, the oil must be in such small drops that they will not float. Products known as emulsifiers cause the oil to break down in such small drops. So emulsions consist of a mixture of 3 products: water, oil and an emulsifier.

An emulsifiable concentrate is a concentrated product that will turn into an emulsion when mixed with water. Emulsifiable concentrates are oils in which a pesticide has been dissolved and an emulsifier has been added. The initials E or EC are used to indicate that the product is an emulsifiable concentrate. A number added to the initials indicates pounds of pesticide contained in one gallon of emulsifiable concentrate. Malathion 2 EC, means that 2 lbs of malathion are contained in 1 gallon of the emulsifiable concentrate.

Wettable powders are pesticide formulations frequently used. These carry the initials WP or W. Wettable powders are supposed to be mixed with water and applied as a spray. A type of detergent or wetting agent is added to the powder to facilitate the mixing. It is important to keep in mind that the powder does not dissolve in the water; making a solution such as sugar and water will do. The mixture of powder and water make a suspension, such as the muddy water made by mixing soil and water. Suspensions need to be stirred often to keep the powder from settling. Dusts are dry formulations that are intended for use as they come in the container without dilution. The active ingredient contained in the dust has already been diluted by mixing it with an inert powder such as talcum.

Let us compare SEVIN D 5% with SEVIN WP 50%. The wettable powder has a concentration of active ingredient 10 times stronger than the dust, because the wettable powder is supposed to be diluted with water. The dust is ready to apply as it comes. Never apply wettable powders as a dry dust to plants; it will be an extremely high rate of pesticide application.

Phytotoxicity refers to the toxic action of a pesticide on a plant. Emulsifiable concentrates are more likely to be phytotoxic than wettable powders. Wettable powders contain in addition to the pesticide: talcum and wetting agents. These two products are not likely to be phytotoxic.

Prog.	Duty	Task	Page
CORE	0600	0601	3

INSTRUCTION SHEET

1

(continued)

However, emulsifiable concentrates contain in addition to the pesticide: oil and an emulsifier. Both of these products tend to be phytotoxic. Keep in mind the greater risk of phytotoxicity when emulsifiable concentrates are used.

Prog.	Duty	Task	Page
CORE	0600	0601	4

SELF-CHECK NO. :



DIRECTIONS:

Information needed to answer these questions is in the reference APPLYING PESTICIDES CORRECTLY, A GUIDE FOR PRIVATE AND COMMERCIAL APPLICATORS, pages 23 to 28 and pages 125 to 128. Use also Instruction Sheet No. 1.

1. Which formulations are represented by the following initials?

INITIALS

TYPE OF FORMULATION

EC

G

D

P

WP

B

S

ULV

2. How much Malathion is contained in 1 gallon of Malathion EC 4?

A. 4%

C. 4 pints

B. 4 ounces

D. 4 pounds

3. Which formulation requires no mixing?

A. soluble powder

C. soluble powder

B. Ultra low volume

D. dust

4. What is a pesticide formulation?

A. the concentration of a poison

B. the product that kills pests

Prog	Duty	Task	Page
CORE	0600	0601	3

SELF-CHECK NO. 1

(continued)



4. (continued)

- C. the formula of the material considered to be the active ingredient
- D. the mixture of active and inactive ingredients

5. Which formulation is mixed with water?

- A. Baits
- B. Dusts
- C. Granules
- D. Wettable powders

6. Which formulation of a given pesticide is most phytotoxic?

- A. EC is more phytotoxic than WP
- B. WP is more phytotoxic than EC
- C. EC and WP are equally phytotoxic

7. Which formulation requires most agitation while it is being applied?

- A. S
- B. WP
- C. EC
- D. SP

8. Which formulation represents the greatest hazard for the applicator?

- A. Dust
- B. Granules
- C. Emulsifiable concentrate
- D. Fumigant

9. Which formulation has the lowest concentration of active ingredient?

- A. Dust
- B. Wettable powder
- C. Ultra low volume
- D. Emulsifiable concentrate

Prog	Duty	Task	Page
CORE	0600	0601	6

SELF-CHECK NO. 1

(continued)



10. Which formulation will have the least risk of drift?
- A. Dust
B. Emulsifiable concentrate
C. Granules
D. Fumigant
11. Which formulation is used in seed treatment?
- A. WP
B. B
C. D
D. EC
12. Which formulation is used for soil applications?
- A. G
B. WP
C. D
D. EC
13. Which formulation is used for control of slugs?
- A. D
B. EC
C. WP
D. B
14. Which formulation will not be adequate for foliage application?
- A. EC
B. G
C. D
D. WP
15. A small airplane is to be used over a swamp applying pesticide to control mosquitoes. Select the formulation that will weigh the least?
- A. D
B. EC
C. ULV
D. WP
16. Which type of formulation is most phytotoxic?
- A. Dust
B. Wettable
C. Granules
D. Emulsifiable concentrate

Prog.	Duty	Task	Page
CORE	0400	0601	7

INSTRUCTION SHEET

No. 2

INTERPRETING INFORMATION ON A PESTICIDE LABEL

The label on a pesticide container is a legal document. You must follow its instructions or you are subject to either civil or criminal penalties. Failure to follow label instructions when using a pesticide is a violation of the law.

Read the label carefully before you buy the pesticide. Read it again before mixing, applying pesticides, and again before storing or disposing of pesticides. Follow label instructions carefully to use the pesticide safely and correctly.

The examination required to obtain a Private Pesticide Applicators License is based on information contained in the publication: APPLYING PESTICIDES CORRECTLY, A GUIDE FOR PRIVATE AND COMMERCIAL APPLICATORS. The chapter LABELS AND LABELING, pages 29 to 35, of this publication is the main reference for this module. As you read this chapter find the answers for Self Check No. 2.

On pages 125 to 128 you will find the meaning of many terms used in pest control.

Prog	Duty	Task	Page
CORE 0600	0601		8

SELF-CHECK NO. 2



DIRECTIONS:

USE THE INFORMATION CONTAINED IN THIS PESTICIDE LABEL TO ANSWER QUESTIONS IN SELF CHECK NO. 2

Pramitol®

80 WP

SAMPLE LABEL

Herbicide

For weed control on railroad rights-of-way and industrial sites

Controls johnson-grass, bindweed and other hard-to-kill weeds

25 Pounds
Net Weight

Active Ingredient:
Prometon: 2,4-bis
(isopropylamino)-6-
methoxy-s-triazine 80%
Inert Ingredients 20%
Total: 100%

EPA Est. No. 100-AL-1
EPA Reg. No. 100-536-ZA
Control No. 50590

Pramitol 80WP is a wettable powder.

Warning:

Keep out of reach of children.

See additional warning statements on back of bag

See directions for use on back of bag

CIBA-GEIGY

Used with permission
of CIBA-GEIGY.

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SELF-CHECK NO. 2

(continued)



DIRECTIONS FOR USE AND CONDITIONS OF SALE AND WARRANTY

IMPORTANT: Read the entire Directions for Use and the Conditions of Sale and Warranty before using this product.

Conditions of Sale and Warranty

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application all of which are beyond the control of CIBA-GEIGY or the Seller. All such risks shall be assumed by the Buyer.

CIBA-GEIGY warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use, subject to the inherent risks referred to above. CIBA-GEIGY makes no other express or implied warranty of Fitness or Merchantability or any other express or implied warranty. In no case shall CIBA-GEIGY or the Seller be liable for consequential, special, or indirect damages resulting from the use or handling of this product. CIBA-GEIGY and the Seller offer this product and the Buyer and user accept it, subject to the foregoing Conditions of Sale and Warranty which may be varied only by agreement in writing signed by a duly authorized representative of CIBA-GEIGY.

General Information

Pramitol 80WP is a nonselective herbicide that may be applied in water or phytotoxic oil before or after plant growth begins. When applied with water as the carrier, Pramitol 80WP has minimal activity through foliar contact. Much of its activity is through plant roots; therefore, its effectiveness is dependent on rainfall to move it into the root zone. Very dry soil conditions and lack of sufficient rainfall may result in poor weed control.

Use only in areas where complete control of all vegetation is desired, such as industrial sites, rights-of-way, lumberyards, petroleum tank farms, around farm buildings, along fence lines, etc. When applied to the soil, this product usually inhibits plant growth for a year or more. Pramitol 80WP should not be used on land to be cropped, or near adjacent desirable trees, shrubs or plants, or injury may occur.

Pramitol 80WP is noncorrosive to equipment and metal surfaces, nonflammable, and has low electrical conductivity.

Mixing Instructions

Pramitol 80WP is a wettable powder that should be mixed with water or phytotoxic oil and applied as a spray. Make a slurry by adding Pramitol 80WP to water or phytotoxic oil. Pour the slurry into the spray tank during or after filling. Sufficient hydraulic (jet) or mechanical agitation must be provided during mixing and application to keep the material in suspension. Wash sprayer thoroughly after use.

Directions for Use

Industrial Sites and Noncrop Areas

Apply Pramitol 80WP prior to or up to 3 months after weed emergence. Application rates vary from 1 to 74 lbs. of Pramitol 80WP per acre depending on climatic conditions, soil conditions, weeds present and the stage of growth of the weeds. In the following are recommendations; the higher rates are intended for use on heavier soils where weed growth is heavy and where rainfall is expected to be relatively high. Use the higher rates also where longer residual control is desired in regions with a long growing season.

For best results, apply Pramitol 80WP prior to weed emergence or when weeds are young and actively growing.

For control of annual and susceptible perennial weeds including downy brome grass, oatgrass, goosegrass, quackgrass, puncture vine, goldenrod and plantain: Broadcast 12 to 18 lbs. Pramitol 80WP in 50-100 gals. of water per acre. For smaller areas, apply 4 to 6% of Pramitol 80WP per 1,000 sq. ft. in sufficient water to give thorough and uniform coverage.

For control of hard-to-kill perennial weeds and grasses including johnsongrass, bindweed, and wild carrot: Broadcast 50-74 lbs. Pramitol 80WP in 50-100 gals. of water per acre. For smaller areas, use 1 lb. 2 oz. to 1 lb. 11 oz. of Pramitol 80WP per 1,000 sq. ft. in sufficient water to give thorough and uniform coverage.

For faster top-kill of existing vegetation, apply Pramitol 80WP in diesel oil, fuel oil, or weed oil, use 100-200 gals. of oil per acre. Tall dense vegetation including johnsongrass will generally require a minimum of 150 gals. of oil per acre for thorough coverage.

Under Asphalt Pavement

Pramitol 80WP may be used to extend the useful life of asphalt pavement by preventing weeds from emerging through it. Pramitol 80WP may be applied to the ground before laying asphalt.

Pramitol 80WP should be used only where the area to be treated has been prepared according to good construction practices. The site should be disked, plowed or otherwise prepared in accordance with good construction practices and recompacted to allow good penetration of the Pramitol 80WP mixture.

Pramitol 80WP does not control woody vegetation such as small trees, brush and woody vines. Roots of such species should be grubbed and removed from the site prior to application. If rhizomes, tubers or other vegetative parts are present in the site, they should be removed by scalping with a grader blade.

Pramitol 80WP may be applied to the ground before laying rapid medium or slow curing asphalt coatings such as those used in parking lots, highway shoulders and median strips, roadways and other industrial sites. Pramitol 80WP should be applied just prior to the laying of the asphalt coating to prevent possible lateral movement of the herbicide by rainfall or other mechanical means. Sprayers should be equipped to provide continuous agitation of the spray mixture during application to ensure application of a uniform spray emulsion.

Apply Pramitol 80WP uniformly at the rate of 50-62 lbs. per acre (0.16-0.20 oz. per sq. yd.) in a minimum of 100 gals. of water. Use the lower rate to control annual and susceptible perennial weeds including downy brome grass, oatgrass, goosegrass, quackgrass, puncturevine, goldenrod and plantain. Use the higher rate to control hard-to-kill perennial weeds and grasses including johnsongrass, bindweed and wild carrot.

Precaution: Do not use Pramitol 80WP under asphalt coatings less than 3 inches thick.

Warning

Keep out of reach of children.

Causes eye irritation. Avoid contact with eyes. Wash thoroughly after handling. Harmful if swallowed. Avoid contact with skin, inhalation of dust, and contamination of food and feed.

Do not contaminate water used for irrigation or domestic purposes.

Do not contaminate water by cleaning of equipment or disposal of wastes. Apply this product only as specified on this label.

Do not use for weed control in greenhouses.

Do not reuse container. Destroy when empty.

Pramitol, trademark of CIBA-GEIGY for Pramitol.
U.S. Patent No. 2,909,420

Agricultural Division
CIBA-GEIGY Corporation
Greenboro, North Carolina 27409
CGA 44L2

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SELF-CHECK NO. 2



DIRECTIONS:

Use the resources listed in this module to answer the following questions regarding the pesticide label enclosed.

1. What is the brand name of this pesticide?
2. What is the common name of this pesticide?
3. What is the chemical name of this pesticide?
4. What is the type of formulation of this pesticide?
5. What is the signal word of this pesticide?
6. How many pounds of active ingredient are contained in one bag of this pesticide?
7. Is this pesticide supposed to be applied directly to plants as it comes in the container?
8. What does this pesticide control?
9. Is it recommended that this pesticide be used in the greenhouse?

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SELF-CHECK NO. 2

(continued)



10. What precautions does the applicator need to observe to avoid contamination?
11. Is this pesticide flammable?
12. Is this pesticide most effective through plant foliage or through plant roots?
13. Approximately how long is the residual activity of this pesticide?
14. Will this pesticide corrode metal surfaces?
15. Name two carriers (solvents) that can be mixed with this pesticide when applying it.
16. Describe 2 situations in which the use of this pesticide will be indicated.
17. Describe 2 situations in which the use of this pesticide will not be advisable.
18. What company manufactures this pesticide?
19. After reading this label what means of protection would you use when mixing and applying this pesticide?

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State of Florida
Department of Education
Tallahassee, Florida
Betty Castor, Commissioner
Affirmative action/equal opportunity employer

Division of Vocational, Adult, and Community Education

DVACE/06/91/550

12345789/9987654321

AG 409 BK 91

CAREER MERIT ACHIEVEMENT PLAN (CAREER MAP)

AGRITECHNOLOGY

(8106800)
(0101.039901)

STUDENT'S NAME



State of Florida

An affirmative action/equal opportunity employer

DEPARTMENT OF EDUCATION

Betty Castor, Commissioner

DIVISION OF VOCATIONAL, ADULT, AND COMMUNITY EDUCATION

Robert S. Howell, Director

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FOR FURTHER INFORMATION, CONTACT

Bureau of Vocational Program and Staff Development
Division of Vocational, Adult, and Community Education
Department of Education
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**THIS MERIT ACHIEVEMENT PLAN RECORDS THE
ACHIEVEMENTS OF:**

**Student's
Name** _____

**Student's ID
Number** _____

**Student's
Address** _____

**Instructor's
Name** _____

Initials _____

School _____

**Date
Started** _____

**PRIMARY JOB TITLES FOR
THIS INSTRUCTIONAL PROGRAM**

- Agricultural Product Marketing Representative
- Agricultural Product Salesperson
- Custom Harvest Operator
- Farm and Garden Supply Worker
- Farmer (OES #71002505)
- Farm-Machine Tender (DOT #409.685-010)
- Farm Worker (OES #74002502)
- Farmworker, Diversified Crops (DOT #407.687-010)
- Farmworker, Livestock (DOT #410.664-010)
- Fertilizer Service Worker

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OVERVIEW

This Career MAP includes the competencies required for entry into the work force as an agritechnology worker. Business and industry representatives have recommended that students in this field master these competencies in order to become employable. Local education agencies (LEAs) may adapt these competencies to meet their work-force needs.

Purposes of the MAP

The purposes of the MAP are to display the student performance standards (SPSs) required by the LEA and to document the level of achievement on SPSs that the student demonstrates.

How to Use the MAP

Administrator and Instructor. The administrator and instructor can use Career MAPs in curriculum planning, program updating and improvement, and teacher recruitment, selection, and updating. If the LEA changes or adds SPSs, the revised or additional SPSs should be included in the blank boxes that appear within each intended outcome or at the end of this MAP.

Instructor. The instructor can use Career MAPs to keep track of student progress on SPSs. By periodically reviewing the ratings on standards, the instructor can identify a student's strengths and weaknesses and on that basis identify the skills for which the student needs remedial instruction or advanced training. MAPs can also be useful in student counseling and evaluation.

Co-op Instructor/Employer. The employer who sponsors a co-op program should use the Career MAP for keeping a record of the student's performance on appropriate standards. The MAPs will also help the co-op instructor/employer in counseling and evaluating the student.

Student. The student may use the MAP to show potential employers the performance standards he or she has mastered. In order to present a complete record, the student should encourage the co-op instructor/employer to rate his or her level of achievement on all the appropriate SPSs and to fill in the verification form in the back of this MAP.

Employer. The MAP shows an employer the SPSs mastered by the student (a prospective employee) and the proficiency level achieved on each one. This information can help the employer make decisions about hiring, job assignments, and job-training needs.

Rating Student Performance

Performance Competencies. Ratings on SPSs should be based upon business/industrial performance standards. The evaluator observes and evaluates student performance as he or she would in the role of the employer or supervisor.

For each skill listed, the learner receives a rating of 1, 2, or 3. Each rating indicates a particular level of achievement:

- 1 = Learner demonstrates knowledge and understanding of this SPS, but is not yet able to apply that knowledge or understanding.
- 2 = Learner performs this SPS satisfactorily with only periodic supervision.
- 3 = Learner performs this SPS satisfactorily without supervision.

Whenever a performance standard is demonstrated, the instructor checks the appropriate rating box (1, 2, or 3) and initials and dates the verification line. If the student later demonstrates a higher level of achievement on a performance competency, the instructor checks the higher level and then enters his or her initials and the new date on the verification line, as shown in the following example:

04 03	
Demonstrate the ability	1
to use an equipment manual	2 ✓
	3 ✓
MP (9/14/90) MP 11/13/90 K	
Verification	

Knowledge Competencies. For each SPS that is a knowledge competency only, with no manipulative skill involved, only one level of achievement is possible. If the student masters the competency, he or she receives a check in the bottom box ("K"), as shown below:

02 11	
Describe the causes and ef	1
fects of air, water, and land	2
pollution, and identify ways to	3
prevent pollution	
MP 9/2/90 K ✓	
Verification	

NOTE: An SPS without a checked rating indicates that the learner has not mastered the standard from lack of ability, time, opportunity, or need (the student's area of specialization may not have required it).

01.0 DESCRIBE THE SOCIOECONOMIC ROLE OF AGRICULTURE.

01.01
Prepare an overview of the history of agriculture.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

01.02
Discuss agricultural products and services important to the local, state, national, and global economy.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

01.03
Investigate career opportunities in agriscience and identify which school activities would help one prepare for those careers.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

01.04
Discuss agriculture's role in the interaction of population, food, and energy.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.0 APPLY IMPORTANT SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES.

02.01
Discuss the importance of scientific classification in agriculture.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.02
Use scientific methods to solve problems in agriculture.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.03
Demonstrate the use of genetics, including probability applications, through an agricultural project/activity.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.04
Analyze how recent technology is impacting agriscience.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.05
Identify the components of an agricultural ecosystem, and recognize the role of each.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.06
Construct and analyze a diagram of a biological food chain common to Florida agriculture and natural resources.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.07
Describe how water, carbon, nitrogen, oxygen, sulfur, and phosphorus are recycled naturally.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.08
Evaluate soil profiles, land-capability classes, and soil-conservation practices.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02.09
List the components of Florida's freshwater systems (lakes, ground-water, aquifer, sinkholes, rivers, and swamps), and explain the importance of managing these resources.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

02 10 Explain how increasing or decreasing the use of one natural resource may affect another resource 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02 11 Describe the causes and effects of air, water, and land pollution, and identify ways to prevent pollution 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02 12 Explain the flow of energy from the sun, through agricultural systems (i.e. the common food pyramid) and back into the abiotic environment 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
02 13 Recognize the environmental requirements necessary for a productive natural or man-made aquaculture system 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	02 14 Apply principles of sound waste management to environmental problems common to agricultural systems 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
03.0 PRACTICE AGRICULTURAL SAFETY.		
03 01 List the most common causes of agricultural accidents 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03 02 Discuss the importance of following proper safety precautions 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03 03 Demonstrate safety procedures in the classroom and laboratory 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
03 04 Describe the importance of following the directions on chemical containers and in equipment operator manuals 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03 05 Recognize the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR) 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	03 06 Demonstrate safe and effective use of laboratory equipment, instruments, and materials 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

04.0 DEMONSTRATE THE USE OF TOOLS AND EQUIPMENT, AND DESCRIBE THE PRINCIPLES OF AGRICULTURAL MECHANICS.

04.01
Describe the importance of using the proper tools and equipment for the job.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

04.02
Describe the principles of selected mechanical applications (e.g., levers, pulleys, hydraulics, internal combustion).

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

04.03
Demonstrate the ability to use an equipment manual.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

04.04
Demonstrate the use of selected tools and equipment.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

04.05
Service, maintain, and store tools, equipment, and supplies.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.0 DESCRIBE THE PRINCIPLES OF PEST MANAGEMENT FOR INSECTS, DISEASES, AND WEEDS.

05.01
Identify major types of pests and weed infestations.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.02
Identify and select an appropriate control for each major type of pest, including the use of Integrated Pest Management.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.03
Describe symptoms of pesticide poisoning.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.04
Extract pertinent information from a pesticide label.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.05
Select, mix, and apply a nonrestricted chemical, according to the label and local, state, federal, and EPA regulations.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.06
Clean and store pesticide application equipment, safety clothing, and safety equipment.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.07
Identify the proper disposal of containers and residual pesticides.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

05.08
Calibrate spray equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐
2 ☐
3 ☐
K ☐

Verification _____

1 ☐	1 ☐	1 ☐
2 ☐	2 ☐	2 ☐
3 ☐	3 ☐	3 ☐
K ☐	K ☐	K ☐
Verification	Verification	Verification

06.0 DESCRIBE THE PRINCIPLES OF PLANT GROWTH AND REPRODUCTION.

06.01 Identify the raw materials and products of photosynthesis and respiration, the plant structures involved, and the environmental conditions necessary for each reaction.	1 ☐ 2 ☐ 3 ☐ K ☐	06.02 Describe the functions of roots, stems, leaves, and flowers.	1 ☐ 2 ☐ 3 ☐ K ☐	06.03 Demonstrate sexual and asexual plant propagation.	1 ☐ 2 ☐ 3 ☐ K ☐
Verification		Verification		Verification	

06.04 Demonstrate the effects of nitrogen (N), phosphorus (P) and potassium (K) on plant growth.	1 ☐ 2 ☐ 3 ☐ K ☐	06.05 Extract pertinent information from a fertilizer label.	1 ☐ 2 ☐ 3 ☐ K ☐	06.06 Describe the short- and long-range impact of fertilizer on people and the environment.	1 ☐ 2 ☐ 3 ☐ K ☐
Verification		Verification		Verification	

1 ☐	1 ☐	1 ☐
2 ☐	2 ☐	2 ☐
3 ☐	3 ☐	3 ☐
K ☐	K ☐	K ☐
Verification	Verification	Verification

07.0 APPLY MANAGEMENT SKILLS AND ECONOMIC PRINCIPLES TO AGRIBUSINESS AND NATURAL RESOURCES.

07.01 Identify basic economic principles applicable to agribusiness.	1 ☐ 2 ☐ 3 ☐ K ☐	07.02 Explain the importance of local, state, and federal regulations and required documentation affecting agriculture.	1 ☐ 2 ☐ 3 ☐ K ☐	07.03 Describe the types of agribusiness by organizational structure.	1 ☐ 2 ☐ 3 ☐ K ☐
Verification		Verification		Verification	

07.04 Select and use computer applications appropriate to agribusiness.	1 ☐ 2 ☐ 3 ☐ K ☐	07.05 Form one or more inferences or hypotheses from records summarized in tables, graphs or pictures.	1 ☐ 2 ☐ 3 ☐ K ☐	07.06 Keep and maintain supervised agricultural experience (SAE) records.	1 ☐ 2 ☐ 3 ☐ K ☐
Verification		Verification		Verification	

07 07
Interpret legal descriptions of
land in Florida.

1 ☐
2 ☐
3 ☐
K ☐

Verification

1 ☐
2 ☐
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**08.0 EXPLAIN THE BASIC FUNCTIONS OF THE MARKETING
PROCESS IN AGRICULTURE.**

08 01
Describe key factors in
marketing agricultural products

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08 02
Select agricultural products
according to grades and
standards

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**09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS,
AND LEADERSHIP SKILLS.**

09 01
Demonstrate acceptable work
habits and attitudes.

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09 02
Follow oral and written
directions with understanding,
form questions that clarify
directions, as needed

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09 03
Communicate effectively in
oral, written, visual, and
nonverbal modes, demonstrate
effective telephone skills

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Verification

09 04
Recognize and demonstrate
reflective listening skills and
assertive communications skills
in the workplace

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Verification

09 05
Conduct small, informal group
meetings

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09 06
Demonstrate a knowledge of
the opportunities for leadership
development available through
an appropriate student
organization

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10.0 EXPLORE THE SCOPE OF THE AGRISCIENCE INDUSTRY.

10.01 Investigate career opportunities in agriscience industries. Levels I and II. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	10.02 Describe training requirements for entry and advancement in agriscience careers. Levels I and II. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	10.03 Identify professional organizations and trade journals in the agriscience industry. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

11.0 PROVIDE FOR PROPER ANIMAL HEALTH AND NUTRITION.

11.01 Recognize and describe prevention and treatment of common animal diseases, disorders, and pests. Levels I and II. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.02 Read, interpret, and follow directions on pesticide, medication, and other additive labels. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.03 Clean and disinfect animal equipment and facilities. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
11.04 Explain proper disposal of animal waste with regard to sanitation, economics, and environmental implications. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.05 Describe nutritional requirements of animals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.06 Formulate and compute least-cost feed rations. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
11.07 Select growth stimulators and implants. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	11.08 Determine feeding rates and methods of feeding animals. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification

1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____
12.0 IDENTIFY PROCEDURES IN ANIMAL PRODUCTION AND REPRODUCTION.		
12.01 Identify the major parts of livestock and poultry anatomy 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.02 Identify commercially important breeds of animals 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.03 Describe desirable characteristics of breeding and market animals 1 _____ 2 _____ 3 _____ K _____ Verification _____
12.04 Identify wholesale cuts of beef, pork, lamb, and poultry 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.05 Compare and select appropriate breeding methods for different agricultural enterprises 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.06 Explain the reproductive cycles of commercially important animals 1 _____ 2 _____ 3 _____ K _____ Verification _____
12.07 Identify signs of animal pregnancy, parturition, and infertility 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.08 Describe approved care for newborn animals 1 _____ 2 _____ 3 _____ K _____ Verification _____	12.09 Describe methods of permanent animal identification 1 _____ 2 _____ 3 _____ K _____ Verification _____
12.10 Describe methods of restraining, loading, handling, and transporting animals safely 1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____
1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____
1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____	1 _____ 2 _____ 3 _____ K _____ Verification _____

13.0 USE PROCEDURES FOR EXHIBITING AND MARKETING ANIMALS.

13.01
Demonstrate the procedures for preparing, maintaining, and exhibiting commercially important animals.

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13.02
Collect and interpret market reports and identify market outlets for livestock.

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13.03
Compare and select appropriate marketing systems.

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13.04
Determine appropriate evaluation criteria for animals.

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13.05
Prepare appropriate shipping and health certificates required for exhibiting or marketing animals.

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14.0 COMPARE, SELECT, AND USE PLANT-PRODUCTION SYSTEMS.

14.01
Compare different plant production systems.

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Verification

14.02
Propagate, grow, and transplant plants.

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Verification

14.03
Identify varieties of local commercial plants and food crops.

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Verification

14.04
Select and prepare site and seedbed for planting.

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Verification

14.05
Identify methods of pruning plants to achieve desired growth and to maintain health.

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Verification

14.06
Calculate planting rate and spacing, solve time, distance, area, and volume problems in agriculture.

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14.07
Operate and adjust planting equipment.

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Verification	Verification	Verification

15.0 FERTILIZE PLANTS AND CROPS.

15.01 Develop fertilization schedules and calculate fertilizer rates for plants; solve time, distance, area, and volume problems in agriscience. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.02 Identify common nutrient deficiency symptoms in plants. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.03 Calibrate fertilization equipment and fertilize plants; solve time, distance, area, and volume problems in agriscience. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
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15.04 Interpret information on a fertilizer label. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.05 Compare sources and forms of nutrients. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	15.06 Determine methods of applying fertilizer materials. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
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16.0 IRRIGATE PLANTS AND CROPS.

16.01 Recognize soil and plant conditions indicating irrigation needs, and develop an irrigation schedule. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.02 Compare and select irrigation equipment and methods. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification	16.03 Install, operate, maintain, and repair irrigation equipment. 1 ☐ 2 ☐ 3 ☐ K ☐ Verification
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17.0 CONTROL PLANT PESTS.

17.01
Identify common plant pests
and their damages

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Verification

17.02
Describe life cycles of insects
pests and diseases

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Verification

17.03
Identify the procedures and
requirements for obtaining a
restricted use pesticide
operator's license

Verification

17.04
Select, mix, and apply a
nonrestricted chemical
according to the label and
local, state, federal and EPA
regulations

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18.0 OPERATE, MAINTAIN, AND SERVICE FACILITIES, TOOLS, AND EQUIPMENT.

18.01
Demonstrate basic facility
maintenance, installation, or
repair

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2 ☐
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Verification

18.02
Safely operate, maintain,
service, and repair equipment

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Verification

18.03
Use and maintain hand tools
and power equipment (e.g.
power saws, welders)

Verification

18.04
Maintain and service small
gasoline engines

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19.0 DESCRIBE PROCEDURES FOR HARVESTING AND MARKETING PLANT MATERIALS.

19.01 Determine maturity, condition, and volume of crops to be harvested 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	19.02 Describe procedures for harvesting crops 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	19.03 Determine kinds and types of storage facilities for crops 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
19.04 Grade, treat, pack, and/or store harvested crop 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	19.05 Interpret and analyze market information 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	19.06 Compare, select, and locate marketing channels, and develop a marketing program 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification

20.0 APPLY PRINCIPLES OF AGRIBUSINESS FINANCE.

20.01 Identify major sources of credit for agribusiness 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	20.02 Complete a business-loan application 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	20.03 Explain the purposes and structures of contracts, leases, deeds, and insurance policies 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
20.04 Maintain and interpret supervised agricultural experience (SAE) records (e.g. depreciation, inventory, budgets) 1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ _____ Verification
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21.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS, AND HUMAN-RELATIONS SKILLS.

AGRITECHNOLOGY

21 01
Conduct group meetings using
parliamentary procedure and
public-speaking skills

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21 02
Identify appropriate work and
personal habits. Level I.

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Verification _____

21 03
Identify appropriate work and
personal habits. Level II

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21 04
Complete a job application

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1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification	1 ☐ 2 ☐ 3 ☐ K ☐ Verification
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VERIFICATION

Each instructor who rates this student on competencies in this MAP should fill in one of the boxes below.

_____ Initials	_____ Signature
	_____ Title
	_____ School Name
	_____ School Address

_____ Initials	_____ Signature
	_____ Title
	_____ School Name
	_____ School Address

_____ Initials	_____ Signature
	_____ Title
	_____ School Name
	_____ School Address

COOPERATIVE WORK EXPERIENCE

In addition to classroom training and laboratory performance identified on the Career MAP, this student has participated in cooperative work experience with employers, as shown below.

Dates	Employer
	Employer's Address
	Supervisor
	Supervisor's Title

Dates	Employer
	Employer's Address
	Supervisor
	Supervisor's Title

Dates	Employer
	Employer's Address
	Supervisor
	Supervisor's Title

This section of the MAP is provided for the instructor, employer, or student to list additional qualifying statements or other pertinent information. All comments should be initialed for verification.

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